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Description

This invention relates to a mop and particularly to a mop for use on floors and other like abrasive surfaces.

It has been proposed in USA Patent Number 4114224 to provide a mop having absorptive elements formed of bonded non-woven fabrics. According to this teaching the fibres constituting the web may be bonded into a fabric by heating where the fibres are thermoplastic. Alternatively, the bonding may be effected simultaneously with formation of the web, as in spin bonding, or a binder can be applied by immersion, spraying, foam impregnation, or other known technique employing known binders which preferably are non-hydrophillic so that they will not soften when used in hot soapy water. In the preferred construction the binder is printed onto the fabric to be present in a greater amount adjacent to the surfaces that in the interior of the fabric. This construction is said to provide good resistance to abrasion and whilst reducing the absorptive capacity at the surface of the elements, the sides of the elements afford ready access for water to enter the interior of each element.

Mops having elements formed of non-woven fabric bonded by a binder applied to the surface of the fabric in a pattern as described in the preferred embodiment of USA 4114224 are on the market but are found to have certain disadvantages. The feel and handle of the fabric is not soft and flexible and does not give the user the necessary assurance of its suitability in use. Moreover, it has been found that the ability of the elements to retain absorbed water is limited which leads to repeated wringing out of the mop in use, repeated wringing shortening the life of the mop through breakage of the elements.

The feel and handle of the fabric can be improved and the ability of the elements to retain absorbed water can be increased if the binder is omitted. The water absorbency can also be increased by increasing the void volume of the fabric, i.e. by increasing the thickness of the fabric for a given weight of fibre per unit area. It has however, been found that such a fabric, even when mechanically bonded together e.g. by needle punching, exhibits a very low tensile strength which manifests itself in a poor ability to withstand the physical forces to which the elements are subjected in use, both when the mop is being moved across the floor and when it is being wrung out, and the elements rapidly break leading to an unduly short like of the mop.

According to the present invention there is provided a mop comprising a plurality of absorptive elements and means for attaching the elements together and joining the elements to a handle, the elements comprising a homogenous blend of viscose fibres and thermoplastic fibres thermally bonded together, the elements having a water absorbency of at least 7 grammes per gramme of fibres as herein defined and a tensile strength of at least 4 kilogrammes per centimetre width of element.

The water absorbency of the elements is determined by weighing the dry fabric, immersing the fabric in water for 1 minute, removing the fabric from the water and allowing it to drain in the vertical position for 30 seconds before re-weighing.

By providing a void volume giving a water retention of at least 7 grammes per gramme of fabric the necessary water retention properties are achieved for the mop to be used to remove water from a floor without requiring water to be wrung out too frequently from the mop and with a tensile strength of at least 4 killogrammes per centimetre width of element the elements nevertheless have sufficient strength that they do not rapidly break in use and the mop has an acceptable life.

To ensure that the elements have the desired softness and feel the fibres are preferably between 1 and 10 decitex.

The elements preferably comprise a blend of fibres containing between 60% and 90% viscose fibres, more preferably between 70% and 90% viscose fibres. The thermoplastic fibres are preferably polypropylene fibres but alternatively the thermoplastic fibres can be bicomponent filaments.

It will be appreciated that to provide both the water absorbency and tensile strength characteristics of a mop according to the invention the structure of the elements is closely defined. For example, for a given weight of fibres the thickness of the elements could be increased to give increased void volume and hence increased water absorbency but this would reduce the tensile strength. Similarly, using a given weight of fibres in a thinner element of greater surface area having the same void volume would have substantially the same water absorbency but considerably reduced tensile strength per unit width of element. Whilst the invention provides a mop having a range of possible elements this range is restricted by the combination of the two necessary characteristics.

For a given water absorbency per gramme of fibre the thickness of the elements can be increased thereby increasing the tensile strength per centimetre width of the elements. This however, reduces the surface area of the elements as well as reducing their flexibility. In order that the mop covers a satisfactory area of floor at a given sweep, and that the elements have an acceptable flexibility and surface area to rapidly absorb any water, the thickness of the elements should be between 1.4 and 3 millimetres, preferably between 2 and 2.5

millimetres.

Using such elements a mop can comprise between 30 and 50 elements each having a free length of between 20 and 30 centimetres and width of 5 to 10 millimetres.

An embodiment of the invention will now be described with reference to the accompanying diagrammatic drawings in which:

Figure 1 is a perspective view of a strip of non-woven fabric; and

Figure 2 is a sectional elevation of a mop.

There is shown in Figure 1 a strip 1 of non-woven fabric comprising a homogenous blend of viscose and thermoplastic fibres thermally bonded together. The strip is 21 millimetres wide and 500 millimetres long and 2 millimetres thick. The strip is provided at its mid-point with two holes which serve to locate the strip in attaching means as described below. This strip has four longitudinal cuts 3 which separate the strip into three elements 4 each side of the holes 2.

The mop shown in Figure 2 comprises a number of strips 1 which together provide a plurality of absorptive elements of 4. The elements are held together by an attachment means 5 comprising a handle member 6 and a plug member 7. The handle member has a general hemispherical form within which are two hollow pins 8. The plug member 7 has two pins 9 which can be engaged within the hollow pins 8 and snap fitted therein by shouldered ends 10 on the pins 9 engaging a step 11 in the hollow pins 8. A recess 12 on the handle member is adapted to be attached at one end of a handle (not shown).

The strips 1 are clamped between the handle member and plug member with the pins 8 or 9 passing through the holes 2 in the strips 1. It will be appreciated that in order that strips 1 do not all extend in the same direction the holes 2 in alternate strips can be disposed at different angles to the longitudinal axis of the strip to that shown in Figure 1.

A mop as shown was constructed of 12 strips of fabric comprising 85% viscose fibres of 1.7 decitex and 15% polypropylene fibres of 2.0 to 2.5 decitex. The fabric was 2 millimetres thick and each strip of the fabric was cut to form 6 absorptive elements. The total weight of fibres of the mop was 80 grammes and water absorbency was 8.9 gramme per gramme of fibre, the tensile strength being 5.2 kilogrammes per centimetre width of the fabric.

The mop had a soft feel and handle which appealed to users and the mop had a size which gave a good floor coverage in use. Water on the floor surface was quickly absorbed due to the surface area of the mop and the water retained well enough to require the minimum of wringing out. The elements were abrasion resistance and did not rapidly break.

The mop was compared to a mop constructed according to the preferred embodiment of USA 4114224 in which the fabric comprised a blend 34% viscose and modal fibres of 1.0 to 6.5 decitex, 30% polyester fibres of 1.5 decitex and 36% cotton fibres. The fibres were surface bonded by printing a chequered pattern of binder on both sides of the fabric. The fabric was 1.7 millimetres thick in strips 19 millimetres wide with two cuts therein to form four elements. Water absorbency was 5.8 grammes per gramme of fibre and the tensile strength was 6.5 kilogramme per centimetre width of the fabric. The mop comprised 20 strips of fabric each 515 millimetres long and the total weight of fibres in the mop was 103 grammes.

The elements were stiff and hard when compared to a mop according to the present invention. In use the lower water absorbency meant the mop required wringing out at more regularly intervals when the mop was being used to dry a floor and the mop of the present invention lasted 2-3 times as long without the elements breaking.

Claims

1. A mop comprising absorptive elements and means for attaching the elements together and joining the elements to a handle, the elements comprising a homogenous blend of viscose fibres and thermoplastic fibres thermally bonded together characterised in that the elements have a water absorbency of at least 7 grammes per gramme of fibres as herein defined and a tensile strength of at least 4 kilogramme per centimetre width of element.

2. A mop according to claim 1 characterised in that the fibres are between 1 and 10 decitex.

3. A mop according to claim 1 or claim 2 characterised in that the elements comprise a blend of fibres containing between 60% and 90% viscous fibres.

4. A mop according to claim 3 characterised in that the thermoplastic fibres are polypropylene fibres.

5. A mop according to claim 3 characterised in that the thermoplastic fibres are bicomponent filaments.

6. A mop according to any one of the preceding claims characterised in that the elements have a thickness of between 1.4 and 3 millimetres.

7. A mop according to claim 6 characterised in that there are between 30 and 50 elements each element having a free length of between 20 and 30 centimetres and width of between 5 and 10 millimetres.

Patentansprüche

1. Mop, umfassend saugfähige Elemente und Einrichtungen, um die Elemente zusammen anzubringen und die Elemente mit einem Griff zu verbinden, wobei die Elemente eine homogene Mischung von Viskosefasern und thermoplastischen Fasern umfassen, die thermisch miteinander verbunden sind, dadurch gekennzeichnet, daß die Elemente eine Wasseraufnahmefähigkeit von mindestens 7 Gramm pro Gramm Fasern, wie hier definiert, und eine Zugfestigkeit von mindestens 4 Kilogramm pro Zentimeter Elementbreite aufweisen.

2. Mop nach Anspruch 1, dadurch gekennzeichnet, daß die Fasern zwischen 1 und 10 Dezitex liegen.

3. Mop nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Elemente eine Fasermischung umfassen, die zwischen 60% und 90% Viskosefasern enthält.

4. Mop nach Anspruch 3, dadurch gekennzeichnet, daß die thermoplastischen Fasern Polypropylenfasern sind.

5. Mop nach Anspruch 3, dadurch gekennzeichnet, daß die thermoplastischen Fasern Bikomponentenfilamente sind.

6. Mop nach einem beliebigen der vorangehenden Ansprüche, dadurch gekennzeichnet, daß die Elemente eine Dicke zwischen 1,4 und 3 Millimetern aufweisen.

7. Mop nach Anspruch 6, dadurch gekennzeichnet, daß zwischen 30 und 50 Elemente vorhanden sind, wobei jedes Element eine freie Länge zwischen 20 und 30 Zentimetern und eine Breite zwischen 5 und 10 Millimetern aufweist.

Revendications

1. Ustensile de nettoyage comprenant des éléments absorbants et des moyens pour fixer les éléments ensemble et pour joindre les éléments à une poignée, les éléments comprenant un mélange homogène de fibres de viscose et de fibres thermoplastiques liées thermiquement ensemble, caractérisé en ce que les éléments ont une capacité d'absorption d'eau d'au moins 7 grammes par gramme de fibres, comme défini ci-dessus, et une résistance à la traction d'au moins 4 kilogrammes par centimètre de largeur d'élément.

2. Ustensile de nettoyage selon la revendication 1? caractérisé en ce que les fibres sont de 1 à 10 decitex.

3. Ustensile de nettoyage selon la revendication 1 ou la revendication 2, caractérisé en ce que les éléments comprennent un mélange de fibres contenant entre 60% et 80% de fibres visqueuses.

4. Ustensile de nettoyage selon la revendication 3, caractérisé en ce que les fibres thermoplastiques sont des fibres de polypropylène.

5. Ustensile de nettoyage selon la revendication 3, caractérisé en ce que les fibres thermoplastiques sont des filaments à deux composants.

6. Ustensile de nettoyage selon une quelconque des revendications précédentes, caractérisé en ce que les éléments ont une épaisseur comprise entre 1,4 et 3 millimètres.

7. Ustensile de nettoyage selon la revendication 6, caractérisé en ce qu'il est prévu entre 30 et 50 éléments, chaque élément ayant une longueur libre comprise entre 20 et 30 cm et une largeur comprise entre 5 et 10 millimètres.

Fig.1.

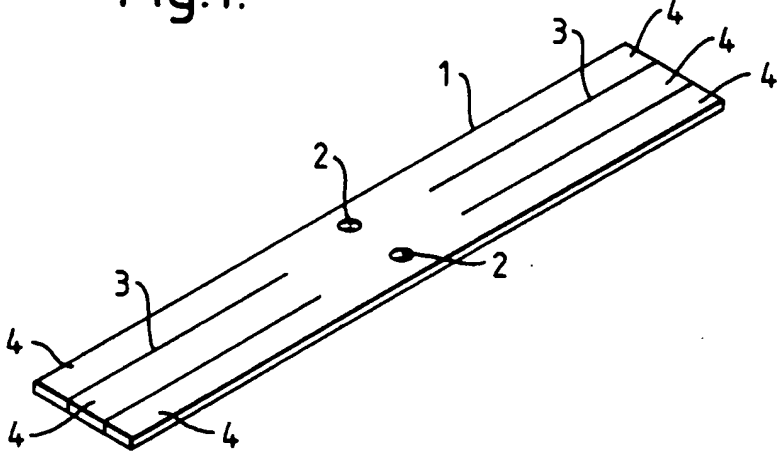

Fig. 2.